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Targets under Trees: One less place to hide

by Grace Janiszewski, Wright Technology Network

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Where can you hide your tank when you are faced with the overwhelming air superiority of American and NATO forces? Like children playing hide-and-seek, quick and easy cover can be found under a fat, old shade tree. While NATO forces in Desert Storm engaged the enemy over endless miles of scorching sand, many of the current hot spots, such as the Balkans, where the men and women of the Air Force are presently and may possibly be tasked, provide significant forest cover for ground forces.

Dr. Atindra Mitra of the Air Force Research Laboratory's Sensors Directorate, Sensor Technology Division at Wright-Patterson Air Force Base, wants to make sure the enemy ground forces have one less place to hide. Mitra, who began his college career as a violin performance major and ended with a doctorate in electrical engineering, is working to improve onboard radar systems to see through the trees. His current project is FOPEN SAR (Foliage Penetration Synthetic Aperture Radar).

"Our goal is to develop innovative automatic target detection algorithms that allow for the detection of military targets that are concealed by foliage or forest clutter," said Mitra. "Standard radar uses X-band radiation at a frequency of 10 gigahertz. The FOPEN SAR program is developing ultra-wideband radars with lower operating frequencies that are in the VHF and UHF ranges. These radars penetrate forest canopy layers and create backscatter from hidden targets. Processing these backscattered waveforms will allow for the identification of targets that are hiding beneath the trees. "

Mitra works with signal processing and hardware design for FOPEN SAR. FOPEN SAR is one of the preliminary projects which will lead into TUT (Targets Under Trees).

Mitra was born in Calcutta, India, and lived for several years in Germany before moving to Lubbock, Texas at the age of six. Before joining AFRL, Mitra was a visiting professor at the University of Dayton and the University of Nevada, Reno. Mitra enjoys traveling, basketball, and chess. When asked which team he supports, he answers, "whoever is playing against L.A."

Mitra recently returned from Lihue, Kauai, Hawaii where he presented a paper on FOPEN SAR in the proceedings of the National Fire Control Symposium. **@**